(4) The accuracy of the furnace control shall be such that the area under the mean time-temperature curve is within 15 percent of the area under the standard time-temperature curve during the first 10 minutes of the test, within 10 percent during the first one-half hour, and within 5 percent for any period after the first one-half hour. At any time after the first 10 minutes of the test the mean furnace temperature shall not differ from the standard curve by more than 100 °C. (180 °F.). Consideration will be given to adjusting the results for variation of the furnace exposure from that prescribed. If corrections are made, they shall be in accordance with the procedures set forth in the ASTM E–119.

(e) *Temperature of unexposed surface.* For the unexposed surface temperature measurement a thermocouple of 0.5 mm. (0.020″) diameter wires shall be soldered centrally with high temperature solder to one surface of a disc of copper 12 mm. in diameter and 0.2 mm. thick. The discs shall be covered with an oven-dry asbestos pad 50 mm. × 50 mm, and 4 mm. thick. The disc and the pad may be fixed to the surface of the steel plate by pins, tape, or a suitable adhesive. The asbestos pad shall have a density of approximately 1,000 kg./m.^{3} and thermal conductivity of 0.11 kcal/m/hr. × °C. at 100 °C. (212 °F.).

(f) *Temperature observations.* (1) All observations shall be taken at intervals not exceeding 5 minutes. The surface temperature on the exterior side of the steel plate shall be measured by thermocouples located as follows:

(i) One thermocouple located approximately in the center of each quadrant of the steel plate (four thermocouples total).

(ii) One thermocouple close to the center of the steel plate.

(iii) One thermocouple in way of or as close as possible to one of the pins or other through metallic connections (if any) used for holding the insulation in place.

(iv) Further thermocouples at the discretion of the testing laboratory or Coast Guard for the purpose of determining the temperature at points deemed likely to give a greater temperature rise than any of the above-mentioned thermocouples.

(2) The average temperature rise on the unexposed surface shall be obtained by averaging the readings of the thermocouples mentioned in paragraphs (f)(1) (i) and (ii) of this section.

(g) *Other observations.* Throughout the test observations shall be made of all changes and occurrences, which are not criteria of performance, but which may create hazard in case of a fire; for example the emission of appreciable volumes of smoke or noxious vapors from the unexposed side of the test specimen. The specimen shall be examined after the test for changes that have taken place and the information shall be noted in the test report.

(h) *Duration of testing.* The test shall be continued for at least one hour or until the maximum surface temperature rise values noted in §164.007–5(a) have been reached, whichever occurs later.

§164.007–5 Test requirements.

The insulation value of the specimens for the full scale test shall be such that the average temperature of the thermocouples on the unexposed surface described in §164.007–4(f)(2) will not rise more than 139 °C. (250 °F.) above the initial temperature, nor will the temperature at any one point on the surface, including any through metallic connection, rise more than 181 °C. (325 °F.) above the original temperature at the end of 60 minutes. The results obtained on the small scale test 2′×2′ (60 cm. × 60 cm.) shall be recorded.

§164.007–6 Test report.

(a) The test report required shall contain at least the following:

(1) Name of manufacturer.

(2) Purpose of test.

(3) Test conditions and date of test.

(4) Description of the panel tested giving the details of the assembly comprising a steel plate, insulation (thickness and density) spacer strips and fastening and the method of mounting the panel assembly in the test furnace.

(5) Complete time-temperature data, including initial temperature, for each thermocouple together with curves of average temperature for the unexposed surface of the insulation and the thermocouple recording the highest temperature. In addition, for §164.007–

9(g)(2), complete time-temperature data consisting of a numerical time-temperature table for each furnace and each surface of insulation thermocouple together with the initial temperature of each thermocouple.

(6) A log maintained by the owner relative to deflections, cracking or loosening of the insulation, smoke or gas emission, glow, flame emission, and any other important data. The time of each observation should be noted.

(7) Photographs of both sides of the panel before and after testing.

(8) Summary of test results.

(b) [Reserved]

§ 164.007–7 Analysis of results.

(a) When only one sample is tested, the results of the test shall be binding and no analysis by the Coast Guard will be undertaken.

(b) When more than one sample of the same density material is tested simultaneously and the results are not exact, the Coast Guard may analyze the results. Data from the tests may be analyzed to determine the minimum thickness to meet the requirements of § 164.007–5(a).

(c) Consideration will be given to correction for inaccurate furnace control in accordance with § 164.007–4(d)(4).

[CGFR 69–72, 34 FR 17498, Oct. 29, 1969; 34 FR 19030, Nov. 29, 1969]

§ 164.007–8 Retests.

(a) Manufacturers of approved structural insulation shall maintain quality control of materials used, manufacturing methods, and the finished product utilizing appropriate quality control testing so as to meet the requirements of this specification, and any other conditions outlined on the certificate of approval. Structural insulation materials are not inspected at regularly scheduled factory inspections; however, approved materials are subject to retest for continued compliance with the requirements of this subpart on the following basis:

(1) The Coast Guard may detail a marine inspector or other Coast Guard designated inspector at any time to visit any place where structural insulation is manufactured to conduct any inspections or examinations deemed advisable and to select representative samples for further examination, inspection, or tests. The inspector shall be admitted to any place where work is done on structural insulation or component materials.

(2) At a frequency of not less than once every 5 years following issuance of approval, samples of an approved material selected from production stock shall be forwarded by the inspector to the Commandant for testing in accordance with the requirements of this subpart. Where the plant is outside the jurisdiction of a Coast Guard District Commander, the frequency of such testing shall be once every 2 years. The cost of such testing shall be borne by the manufacturer. The nature of the product or its production may dictate a differing retest frequency.

(3) The Coast Guard reserves the right to make spot-check tests of approved structural insulation at any time on samples selected by a marine inspector obtained during installation on a vessel. The manufacturer will incur no expense for such tests, but the results, shall be binding upon the approval of his product.

(b) A small scale furnace test (2′×2′ furnace test 60 cm. × 60 cm.) shall be conducted. The time of failure shall not vary from the original small scale test values by more than 10 percent. In addition tests shall be conducted to determine incombustibility (§ 164.009), density and thickness. Values of retesting for density and thickness shall not vary from the original test values by more than 10 percent.

§ 164.007–9 Procedure for approval.

The following items shall be accomplished in sequential order.

(a) *Test request information*. If a manufacturer desires to have a structural insulation approved, a written request shall be submitted to the Commandant of the Coast Guard together with the following:

(1) If the material has already been approved as an incombustible material under subpart 164.009 of this part, the approval number of the material shall be indicated. If not, the procedure set forth in subpart 164.009 of this part shall be followed; and such approval